U.S. Office of Naval Research International Field Office (ONRIFO)

Title: C4-IT 02-004 Third International Conference on Mobile Communication Technologies (3G 2002)

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Keywords

Cellular Communications
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Information Services
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Summary

The Institution of Electrical Engineers hosted the "Third International Conference on Mobile Communication Technologies" (3G 2002) on 8-10 May 2002.

This conference is a principal forum for discussion of progress from the current second generation (2G) mobile communications systems and services toward the third generation (3G) and future systems. It brings together representatives from each sector involved with these systems and services, including the service providers, the system developers, and the researchers in academia and research centers. Participants were mainly from European countries, but there was also some from the United States, the Far East and Australia.

A main point in the discussions was the reorientation from communications to information services. This was stated very clearly and is a significant change in focus for the service providers and developers. The implications are for much more emphasis on information processing, services, and user interfaces, probably as intensive as the emphasis on the communications networks themselves. However, there remained a definite "seam" between the communicators and computing communities, and the merger of these two disciplines is likely to be very slow and difficult due to the very different cultures.

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The Emphasis on Information Services

As noted in the summary above, the vision for 3G and future generations of mobile networking is more oriented toward information services for mobile users rather than simply providing better communications. The opening address by the Right Honorable Douglas Alexander (Member of Parliament and Minister for electronic-Commerce and Competitiveness in the UK) and the keynote address by Professor Mike Walker (Head of Communications Security and Advanced Development at Vodafone) were very explicit in this change of focus.

This is very significant in terms of the movement toward a fully-integrated global information infrastructure (GII) in the commercial sector. The commercial service providers intend to offer value-added information processing and tailored user services as a "layer" above the network layer. The second generation (2G) environment already introduces some of this new capability in the form of location based services and user profiled services, but the trend toward building a robust and highly capable service layer above the network layer will be more intensive during build-up to 3G services over the next four or five years.

Specific emphases are placed on developing user services and human-system interfaces that are suited to users on the move. While the participants had only

vague ideas of what their customers would want, there was a clear intent to concentrate on the information processing services and the user interfaces as keys to developing the market for the underlying networks.

Status and Outlook for a Global Information Infrastructure

Understanding the status and outlook for the commercial GII is difficult due to several factors: lack of a clear business model, limited ability of technology to provide global mobile services, uncertainty as to the types of applications and interfaces that will appeal to the customers, and uncertainties in how the technologies and standards of the Internet and the cellular networks will eventually merge.

There are two very clear tracks toward the future systems. One of these is the track being taken by the data networking sector, including the development of new standards for mobile and wireless computer networks. The other is the track being taken by the cellular communications sector, including on-the-move data and voice services and establishment of a layer above the network for the information services and applications. The common thread that joins both sectors at present is an intent to base network services on the Internet Protocol (IP). The 3G developers and service providers intend to implement IP "end-to-end", and they also intend to base their mobility services on IPv6 and future versions of IP as developed by the Internet Engineering Task Force (IETF).

The merger, at the network layer, of all available forms of information transport was also a clear intent for the GII. The vision is total integration across cellular networks, satellite communications, wireless local area networks (WLANs) and terrestrial networks. The intent is to provide the mobile users with terminals that can automatically select the best available network service and connect to it. Inclusion of direct terminal-to-satellite capability was projected for the year 2007, but this projection appeared to be mainly from a technology viewpoint. It is not clear if the business model has been considered to any extent, so the actual realization of direct-to-satellite capability in the mobile user terminal may be pushed further into the future.

Much discussion was held on technical approaches to address the differences in protocols, standards, and processes between the data networking (e.g. WLANs and other router-based networks) and the cellular networks. Those differences are significant and entail complicated incompatibilities.

Conclusion/Finding

This conference was useful to obtain an update on technical information regarding the evolution to 3G and to understand the strategic objectives and concepts. However, there was a definite lack of information regarding some of the major system-level issues and financial issues.

A general appraisal of the current situation is that pieces of the technology are well understood and can be shown to work, but that the understanding of overall end-to-end systems and services requires much more work. Issues such as system capacity, congestion control, management of Quality of Service, security, and the basic relationship between the cellular and Internet technologies remain open and are only partly recognized by the researchers. The "seam" between the data network and telephony communities is still very apparent. Even the vocabularies are different, and neither side appears to appreciate the technology base of the other to the extent required for a smooth merger of the two.

Contacts

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